



Guide to Dual Flight Operations Performance Checklist

Vaisala RS92-NGP® Sippican B2®

Upper Air Data Continuity Study

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**Prepared by
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**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Observing Systems Branch**

TIME TO LAUNCH	PRE-RELEASE CHECKLIST FOR DUAL FLIGHTS RRS & MICROART
T- 45 minutes	<ul style="list-style-type: none"> • Turn on both the RWS and MicroART computer. Log onto the RWS workstation using your individual Username and Password. • Turn on the GPS repeater. • Log onto the Data Continuity website to retrieve the Data Input Form. • Complete the observer and date fields. <p style="text-align: center;">RWS</p> <ul style="list-style-type: none"> • Open the RWS.NET program and click OK in the NOAA Security Warning Window after reading the message. • Select Run a Live Flight. • Click YES when prompted to power on the UPS. The UPS provides uninterrupted power to the TRS & SPS. A green checkmark in the Hardware Display will indicate the UPS has been successfully powered on. • The TRS will then perform Motor Warm-up Operations and/or Initialization, depending on the ambient temperature. These processes are reflected in the TRS Display, Status Messages and Hardware Status Manager. <p>*Important: Allow 30 minutes prior to Baseline for the TRS to warm-up. This time is necessary, especially in colder temperatures. The TRS Status Line on the Antenna Orientation Display and the Status Messages will indicate “TRS is Ready” when warm-up and initialization is complete.*</p> <p style="text-align: center;">MicroART</p> <ul style="list-style-type: none"> • When prompted, set the date and time. • Proceed through the MicroART Virus Scan. • Turn MicroART off of Standby and Low Sensitivity.
T- 44 minutes	<ul style="list-style-type: none"> • Begin filling the upper-air balloon and prepare the flight train (reference Guide to Dual Flight Operations) <p>*Warning: Because some inflation bays are lower than others and additional weights increase its size, be mindful when filling the balloon and preparing it for release so that it does not touch the ceiling. This can puncture the balloon, creating a leak, or pop the balloon completely. *</p>
T-20 minutes	<ul style="list-style-type: none"> • Inspect and prepare radiosondes in accordance with vendor specifications. • Record serial number for both Radiosondes in the Data Input Form.

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T-17 minutes	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Position the antenna within a few degrees of the baseline point using the Antenna Display window. • Complete Administrative Display and click Next. • Complete Equipment Display and click Next. <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • Position the antenna manually within a few degrees of the documented target antenna. Turn the target antenna switch on and allow the antenna to lock on the target antenna by pressing Far Auto. • From the ART Options Menu select ART Observation. The Administrative Data screen appears. Complete the Administrative Data screen. • Complete the Flight Equipment Data screen.
T-16 minutes	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Set the Radiosonde Frequency in the TRS Display after placing the TRS in Manual Track Mode. This can be done by clicking Edit, entering the frequency, clicking Set and turning AFC ON. • Point the TRS toward baseline Azimuth/Elevation in the TRS Display by entering the values in the desired cells and clicking Move Antenna. <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • Complete the VIZ Radiosonde Data screen. • Insert Calibration Diskette into drive when prompted.

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T-14 minutes	<ul style="list-style-type: none"> Complete radiosonde procedures, including battery preparation and activation. Place the radiosondes in the appropriate location for baseline. Suggested frequency for RS92-NGP is 1676 MHz and for Sippican B2 is 1680 MHz. Ensure that the Sippican B2 and Vaisala RS92-NGP radiosondes are no closer than 6 feet from one another during the baseline process. <p>* Plug in and lock on to B2 radiosonde before plugging in RS92-NGP*</p> <p style="text-align: center;">RWS</p> <ul style="list-style-type: none"> Complete the Surface Observation Display. Click Next to begin the baseline process. <p>*Ensure battery is plugged in before beginning baseline*</p> <ul style="list-style-type: none"> The Waiting for SPS to Initialize window will appear. Once the SPS initializes, the Baseline Display window will begin populating first with PTU data, followed by Lat/Lon data. <p>(If the SPS doesn't initialize by the end of the progress bar, click Wait Again.)</p> <p>*** Wait at least 5 minutes before proceeding to next step ***</p> <p>NOTE: Ensure pressure sensor has stabilized prior to accepting baseline. The battery and pressure sensor must warm-up. If the pressure sensor is not warmed up, pressure discrepancy may create height errors.</p> <ul style="list-style-type: none"> If the pressure discrepancy is within ± 3 hPa and the temperature and relative humidity values look reasonable click Accept. Do not complete baseline without GPS. "Waiting for Release" will be displayed on the RWS screen. <p style="text-align: center;">MicroART</p> <ul style="list-style-type: none"> Fill out the Surface Data Screen using the most recent surface observation. Continue to the cross-check message screen to review any inconsistencies. Insert Log Diskette and press enter when ready. Adjust the Azimuth to the appropriate angle to prepare for baseline and acquire a radiosonde signal. Check the AFC meter to ensure the transmitter signal is being received clearly. Press standby once this is complete. Press Enter to begin the baseline check. Once the readings become stable, compare the instrument's readings against the surface conditions entered. <p>*** Wait at least 5 minutes before proceeding to next step ***</p> <ul style="list-style-type: none"> Press F10 to complete baseline. After the baselining tests are complete, accept the radiosonde by clicking enter if the pressure discrepancy is within ± 5hPa. The Antenna Lock screen will display ***RADIOSONDE READY FOR RELEASE***.

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T-09 minutes	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> Put the TRS in Manual Track Mode and direct the Azimuth/Elevation to where the radiosonde is expected to travel. <p>NOTE: To point the TRS north, input an AZ of 0 degrees. The TRS is 180 degrees out from the wind direction.</p> <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> Ensure that Standby is on before proceeding to the release site. Move Azimuth/Elevation to where the radiosonde is expected to travel. Ensure that Track Mode is set to Manual. <p>NOTE: To point the MicroART north, input an AZ of 0 or 180 degrees.</p> <ul style="list-style-type: none"> Proceed to the release site.
T-03 minutes	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> Check the RCDU to ensure frequency has not shifted off the radiosonde and the signal is strong. (Listen to audio- noise heard is the radiosonde) Double check to ensure the TRS Antenna is positioned to the appropriate azimuth and elevation. <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> Open the remote release panel and turn up speaker volume to check for a clean signal.
T-02 minutes	<ul style="list-style-type: none"> Tie the radiosondes to the assembled flight bar and ensure they are hanging at the same height relative to one another. Check the flight train's integrity and visually survey the release zone and the anticipated path of flight. Minimize potential for obstacles. If Applicable: Call the local airport control tower and request flight clearance for balloon release.
T-00 minutes	<ul style="list-style-type: none"> Observer should release the radiosondes and use the RCDU to verify the frequency has not shifted off the radiosonde and the signal is strong. (Listen to audio) Double check to ensure the Antenna is positioned to the appropriate azimuth and elevation and that AFC is on using the RCDU.

IN ORDER	IN-FLIGHT CHECKLIST FOR DUAL FLIGHTS RRS & MICROART
STEP 1	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Ensure the release has been detected (Release time is displayed in the flashing blue screen and in the Status Messages), and click “Continue”. Update Post-Release Surface Observation as necessary. <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • On the Antenna Lock screen, enter the time the antenna locked on to the radiosonde and press Enter. • Check the MCU readings and MicroART computer displays and verify the signal is strong. If the signal is strong and the antenna is locked on the main signal, delete position data up to the point that lock-on occurred. • Verify the Surface Observation screen as necessary.
STEP 2	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Verify that the TRS signal strength is acceptable. If GPS is being received, place the Antenna into the Search mode using the Antenna Orientation/TRS Display Point the TRS toward the balloon by inputting Azimuth/Elevation values and clicking Move Antenna or Move to GPS. (Do not click Move to GPS if GPS data is unavailable) • The Search Track Mode can be used to search for the radiosonde. Auto Track mode will automatically be selected once the TRS has detected the strongest signal. • Open up the Processed Tabular Display and scroll to the bottom of the display. (Right-click on the scroll bar and select Bottom) <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • Monitor the signal strength and adjust the Azimuth/Elevation if necessary to maintain a lock onto the radiosonde. The audio should be utilized to verify accurate instrument tones and to check for interference or signal loss.
STEP 3	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Verify that Release has been detected correctly. Ensure the first pressure data point below the red line in the Received PTU Tabular Display has a pressure equal to or less than the Release Pressure shown in the Surface Observation at Release. Check the Geopotential Height and ensure it increases with time. Otherwise change the release time as appropriate.

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STEP 4	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Monitor flight using Displays and Plots. (Basic Screens: SPS/GPS Window, Antenna/TRS Display, Temp or Temp/RH Plot, Trajectory Plot, Processed Tabular Data Display or Processed Data Bar) <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • Monitor flight using Displays and Plots.
STEP 5	<ul style="list-style-type: none"> • Always look at Check and Status Messages, Temp or Temp/RH Plot and verify the Ascent Rates are realistic (averages approximately 5 m/sec). • Verify RADAT or Coded Messages appear to be correct.
STEP 6	<ul style="list-style-type: none"> • Review selected plots and data at least every 15 minutes during the flight. Always perform Step #5 prior to message transmission. • Prior to Message Transmission at termination, ensure all Check and Status Messages look reasonable. Do the same for the data plots.
STEP 7	<p style="text-align: center;"><i>RWS</i></p> <ul style="list-style-type: none"> • Turn UPS OFF at termination through the Offline Maintenance Menu. <p style="text-align: center;"><i>MicroART</i></p> <ul style="list-style-type: none"> • Upon transmitting the coded messages, exit the Art Observation option.
STEP 8	<ul style="list-style-type: none"> • Close the flight. DO NOT CLOSE RWS. • Upon termination of the flight, complete the online data form with required information and any comments pertinent to the flight. Click Submit.